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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,121	01/16/2004	Shinichiro Gomi	247786US6	5039

22850 7590 08/16/2007

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EXAMINER	
CUTLER, ALBERT H	
ART UNIT	**PAPER NUMBER**
2622	

NOTIFICATION DATE	DELIVERY MODE
08/16/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/758,121	GOMI ET AL.	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on June 6, 2007. Claims 1-5 are pending in the application.

Response to Arguments

2. Applicant's arguments with respect to claim 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boroczky et al.(US 6,950,561) in view of Keating(US 6,072,538) in view of Katayama et al.(US 6,404,936).

Consider claim 1, Boroczky et al. teach:

.A signal processing apparatus(figures 1 and 2), comprising:

a generator configured to generate a luminance signal of an input video signal("luminance in", 2, figure 1);

an extractor(see figure 1) configured to extract a high frequency signal from said input video signal("High Pass Signal", figure 1);

a mask generator(Coding Gain, 14, figures 1 and 2) configured to generate a mask(see columns 3 and 4) by masking image quality degrading components contained in said high frequency signal(The coding gain(14) uses a generated usefulness metric(UME, 18, figure 1) to mask image quality components such as blocking and ringing, column 4, lines 46-51.) and including a low pass filter(52, figure 2) and a mask processor configured to output said mask(The coding gain block(i.e. the mask processor) outputs the mask to the gain control block(16), figure 1.), the low pass filter configured to output a low passed signal(column 5, lines 6-18);

a gain factor generator(16, figure 1, or 36, figure 2) configured to generate a gain factor based on said mask and said low passed signal(See column 3, lines 37-40, column 4, line 66 through column 5, line 5. The low pass filter(52, figure 2), is part of the mask generator(14). Therefore, the gain is generated based on said mask and said low passed signal.);

a contour correction signal generator(22, figure 1) configured to generate a contour correction signal by multiplying said high frequency signal by said gain factor(column 3, lines 39-42); and

a luminance corrector(24, figure 1) configured to correct said luminance signal based on said contour correction signal(column 3, lines 43-45).

However, Boroczky et al. do not explicitly teach that the extractor includes a bandpass filter connected to a coring circuit.

Keating is similar to Boroczky et al. in that Keating teaches of performing digital image enhancement(column 1, lines 4-7). Keating is further similar in that a filtered image signal is multiplied by a gain(200, figure 3, column 4, lines 27-30).

However, in addition to the teachings of Boroczky et al., Keating teaches that the extractor(see figure 3) contains a bandpass filter(170) connected to a coring circuit(180). See column 4, lines 16-36, column 6, lines 36-54, figure 7.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to contain a bandpass filter and coring circuit as taught by Keating in the extractor taught by Boroczky et al. for the benefit of removing noise components from the extracted signal(Keating, column 6, lines 47-54).

However, the combination of Boroczky et al. and Keating does not explicitly teach that the mask generator includes an absolute value calculator and a threshold processor.

Katayama et al. are similar to Boroczky et al. in that Katayama et al. teach of extracting a portion of an image(column 1, lines 5-7). Katayama et al. also similarly teach of a mask generator(26, figure 1, figure 3a).

However, in addition to the teachings of Boroczky et al. and Keating, Katayama et al. teach that the mask generator("Initial Mask Extraction", figure 3a) includes an absolute value calculator and a threshold processor(See figure 3a. A threshold value processor is used to process the absolute values of color components of pixels(S9). In order for there to be absolute values, there must be an absolute value calculator. See column 5, line 42 through column 6, line 14.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include an absolute value calculator and a threshold processor as taught by Katayama et al. in the mask generator taught by the combination of Boroczky et al. and Keating for the benefit of enabling the easy extraction of edges from the image for subsequent contour correction(Katayama et al., column 1, lines 26-40).

Consider claim 3, and as applied to claim 1 above, Boroczky et al. further teach:

A detector(42, figure 2) configured to detect an edge component from said input video signal(column 4, lines 58-65), wherein:

said gain factor generator(36) is configured to control an enhanced amount of said edge component(column 4, line 58 through column 6, line 5).

Consider claim 4, Boroczky et al. teach:

A signal processing method(columns 3-5, figures 1 and 2), comprising the steps of:

generating a luminance signal of an input video signal("luminance in", 2, figure 1);

extracting a high frequency signal from said input video signal, and outputting said high frequency signal("High Pass Signal", figure 1);

generating a mask by masking image quality degrading components contained in said high frequency signal(The coding gain(14) uses a generated usefulness metric(UME, 18, figure 1) to mask image quality components such as blocking and ringing, column 4, lines 46-51.), low pass filtering the signal(52, figure 2), and outputting said mask(The coding gain block(i.e. the mask processor) outputs the mask to the gain control block(16), figure 1.);

generating a gain factor based on said mask and said low passed filtered value(See 16, figure 1, 36, figure 2, column 3, lines 37-40, column 4, line 66 through column 5, line 5. The low pass filter(52, figure 2), is part of the mask generator(14). Therefore, the gain is generated based on said mask and said low passed signal.);

generating a contour correction signal by multiplying said high frequency signal by said gain factor(column 3, lines 39-42); and

correcting said luminance signal based on said contour correction signal(column 3, lines 43-45).

However, Boroczky et al. do not explicitly teach that the extracting includes bandpass filtering and coring.

Keating is similar to Boroczky et al. in that Keating teaches of performing digital image enhancement(column 1, lines 4-7). Keating is further similar in that a filtered image signal is multiplied by a gain(200, figure 3, column 4, lines 27-30).

However, in addition to the teachings of Boroczky et al., Keating teaches that the extractor(see figure 3) contains a bandpass filter(170) connected to a coring circuit(180). See column 4, lines 16-36, column 6, lines 36-54, figure 7.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to contain a bandpass filter and coring circuit as taught by Keating in the extractor taught by Boroczky et al. for the benefit of removing noise components from the extracted signal(Keating, column 6, lines 47-54).

However, the combination of Boroczky et al. and Keating does not explicitly teach that the mask generating includes absolute value calculating and threshold processing.

Katayama et al. are similar to Boroczky et al. in that Katayama et al. teach of extracting a portion of an image(column 1, lines 5-7). Katayama et al. also similarly teach of a mask generator(26, figure 1, figure 3a).

However, in addition to the teachings of Boroczky et al. and Keating, Katayama et al. teach that the mask generator("Initial Mask Extraction", figure 3a) includes an absolute value calculator and a threshold processor(See figure

3a. A threshold value processor is used to process the absolute values of color components of pixels(S9). In order for there to be absolute values, there must be an absolute value calculator. See column 5, line 42 through column 6, line 14.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include an absolute value calculator and a threshold processor as taught by Katayama et al. in the mask generator taught by the combination of Boroczky et al. and Keating for the benefit of enabling the easy extraction of edges from the image for subsequent contour correction(Katayama et al., column 1, lines 26-40).

Consider claim 5, Boroczky et al. teach:

A processor-based device(video receiver, 56, figure 1) configured to implement a method comprising:

generating a luminance signal of an input video signal("luminance in", 2, figure 1);

extracting a high frequency signal from said input video signal, and outputting said high frequency signal("High Pass Signal", figure 1);

generating a mask by masking image quality degrading components contained in said high frequency signal(The coding gain(14) uses a generated usefulness metric(UME, 18, figure 1) to mask image quality components such as blocking and ringing, column 4, lines 46-51.), low pass filtering the signal(52, figure 2), and outputting said mask(The coding gain block(i.e. the mask processor) outputs the mask to the gain control block(16), figure 1.);

generating a gain factor based on said mask and said low passed filtered value(See 16, figure 1, 36, figure 2, column 3, lines 37-40, column 4, line 66 through column 5, line 5. The low pass filter(52, figure 2), is part of the mask generator(14). Therefore, the gain is generated based on said mask and said low passed signal.);

generating a contour correction signal by multiplying said high frequency signal by said gain factor(column 3, lines 39-42); and

correcting said luminance signal based on said contour correction signal(column 3, lines 43-45).

Boroczky et al. do not explicitly teach that said method is implemented via a computer readable storage medium storing a computer readable program.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of using a computer readable medium storing a computer readable program configured to a cause a receiver to execute a method are well known and expected in the art. It would have been obvious to a person having ordinary skill in the art at the time of the invention to store a program implementing the method taught by Boroczky on a computer readable medium for the benefit that the method can be easily reproduced, transferred between devices, read by a processor, updated, and protected from damage in the case of destruction or corruption of the receiver processor.

However, Boroczky et al. do not explicitly teach that the extracting includes bandpass filtering and coring.

Keating is similar to Boroczky et al. in that Keating teaches of performing digital image enhancement(column 1, lines 4-7). Keating is further similar in that a filtered image signal is multiplied by a gain(200, figure 3, column 4, lines 27-30).

However, in addition to the teachings of Boroczky et al., Keating teaches that the extractor(see figure 3) contains a bandpass filter(170) connected to a coring circuit(180). See column 4, lines 16-36, column 6, lines 36-54, figure 7.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to contain a bandpass filter and coring circuit as taught by Keating in the extractor taught by Boroczky et al. for the benefit of removing noise components from the extracted signal(Keating, column 6, lines 47-54).

However, the combination of Boroczky et al. and Keating does not explicitly teach that the mask generating includes absolute value calculating and threshold processing.

Katayama et al. are similar to Boroczky et al. in that Katayama et al. teach of extracting a portion of an image(column 1, lines 5-7). Katayama et al. also similarly teach of a mask generator(26, figure 1, figure 3a).

However, in addition to the teachings of Boroczky et al. and Keating, Katayama et al. teach that the mask generator("Initial Mask Extraction", figure 3a) includes an absolute value calculator and a threshold processor(See figure 3a. A threshold value processor is used to process the absolute values of color

components of pixels(S9). In order for there to be absolute values, there must be an absolute value calculator. See column 5, line 42 through column 6, line 14.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include an absolute value calculator and a threshold processor as taught by Katayama et al. in the mask generator taught by the combination of Boroczky et al. and Keating for the benefit of enabling the easy extraction of edges from the image for subsequent contour correction(Katayama et al., column 1, lines 26-40).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boroczky et al. in view of Keating in view of Katayama et al. as applied to claim 1 above, and further in view of Cohen-Solal et al.(U.S. Patent 7,057,636).

Consider claim 2, and as applied to claim 1 above, Boroczky et al. teach of a mask generator, and of extracting a high frequency signal(see claim 1 rationale). However, the combination of Boroczky et al., Keating, and Katayama et al. does not explicitly teach that the mask generator generates a mask by repeating a number of times dilation processing or erosion processing.

Cohen-Solal et al. is similar to Boroczky et al. in that a camera(50, figure 1c) is used to capture video data(column 3, line 66 through column 4, line 18), and that the camera also includes a processor(54, figure 1c) and a CPU(52, figure 1c). Cohen-Solal et al. is further similar in that a mask is used(column 7, lines 47-55).

In addition to the teachings of Boroczky et al., Keating, and Katayama et al., Cohen-Solal et al. teach performing an arbitrary number of times dilation processing or erosion processing using a mask(column 9, lines 42-55).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to perform an arbitrary number of times dilation processing or erosion processing using a mask as taught by Cohen-Solal et al. on the high frequency signal taught by the combination of Yamazaki et al. and Hattori et al. for the benefit that a combination of dilation and erosion processing would fill unwanted gaps between visual image components, while still keeping the components substantially the same scale(Cohen-Solal et al., column 9, lines 49-52).

Conclusion

7. Any objections made to the claims by the Examiner are herby withdrawn in view of Applicant's response.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory

action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER